## Table C-1: Baseline Indicator Levels (Effects Matrix for Bull trout and Salmon)

**Note: Two new indicators have been added (Channel Confinement, and Recruitment and Population Heterogeneity bull trout). All others are derived from NMFS[1] and USFWS[2]*

| Pathway | Indicators | Properly Functioning | At Risk | Not Properly Functioning |
|---|---|---|---|---|
| Water Quality | Temperature<br>*Bull trout* | (7day average temp.)<br>- Incubation 36-41ºF<br>- Rearing 39-54 ºF<br>- Spawning 39-48ºF<br>- Migration route never exceeds >59ºF<br>- No thermal barriers. | (7day average temp.)<br>- Incubation 42-43ºF<br>- Rearing 55-59ºF<br>- Spawning 49-50ºF<br>- Migration route occasionally >59ºF | (7day average temp.)<br>- Incubation >43ºF<br>- Rearing >59ºF<br>- Spawning >50º<br>- Migration route regularly >59ºF |
| | Temperature<br>*Salmon* | 50-57ºF | - Spawning 57-60ºF<br>- Migration/rearing 57-64ºF | - Spawning >60ºF<br>- Migration/rearing >64ºF |
| | Sediment<br><br>(spawning areas) | <12% fines (<0.85mm) in gravel<br><br>- Turbidity low | 12-17% west side<br>12-20% east side<br><br>- Turbidity moderate | >17% west side<br>>20% east side. Fines at surface or depth in spawning habitat<br><br>- Turbidity high |
| | Chemical Contamination & Nutrients | Low levels of chemical contamination from agricultural, stormwater runoff, industrial, etc. no excess nutrients no CWA 303d designated reaches. | Moderate levels of chemical contamination from agricultural, stormwater runoff, industrial, etc. some excess nutrients, one CWA 303d designated reach. | High levels of chemical contamination from agricultural, stormwater runoff, industrial, etc. Some excess nutrients, more than one CWA 303d designated reach. |
| Habitat Access | Physical Barriers | Human-made barriers (material, thermal etc.) do not restrict upstream and downstream fish passage at all flows. | Human-made barriers (material, thermal etc.) present in watershed do not allow upstream and/or down stream fish passage at base/low flows. | Human-made barriers (material, thermal etc.) present – do not allow upstream and/or down stream fish passage at a range of flows. |
| Habitat Elements | Substrate | Dominant substrate is gravel or cobble (interstitial spaces clear) or embedded ness<20% | Gravel or cobble is subdominant or if dominant, embedded ness 20-30% | Gravel or cobble is subdominant or if dominant, embedded ness >30% |
| | Large Woody Debris | Coastal Wa. >80 pieces/mile >24' diameter >50 ft. length<br><br>East side: >20 pieces/mile >12' diameter >35 ft. length and adequate sources of woody debris recruitment in riparian areas. | Currently meets standards for properly functioning, but lacks potential sources from riparian areas of woody debris recruitment to maintain that standard. | Does not meet standards for properly functioning and lacks potential large woody debris recruitment. |
| | Pool Frequency<br><br>*Bull trout* | Pool frequency in a reach closely approximates:<br><br>Wetted width / pools/mile<br>0-5' 39<br>5-10' 60<br>10-15' 48<br>15-20' 39<br>20-30' 23<br>30-35' 18<br>35-40' 10<br>40-65' 9<br>65-100' 4<br><br>Meets LWD recruitment standards for properly functioning habitat (above) | Meets pool frequency standards but large woody debris recruitment inadequate to maintain pools over time. | Does not meet pool frequency standard. |
| | Pool Frequency<br>*Salmon* | Pool frequency in a reach closely approximates:<br><br>Channel width / #pools/mile<br>5' 184<br>10' 96<br>15' 70<br>20' 56<br>25' 47<br>50' 26<br>75' 23<br>100' 18<br><br>Meets LWD recruitment standards (above) | Meets pool frequency standards but large woody debris recruitment inadequate to maintain pools over time. | Does not meet pool frequency standards. |
| Habitat Elements | Pool Quality | Pools >lm deep (holding pools) with good cover and cool water, minor reduction of pool volume by fine sediment. | Few deeper pools >1m deep present or inadequate cover/temperature, moderate reduction of pool volume by fine sediment. | No deep pools > 1m and inadequate cover/temperature major reduction of pool volume by fine sediment. |

*continues on next page*

## Table C-1: Baseline Indicator Levels (Effects Matrix for Bull trout and Salmon Combined) Continued

**Note: Two new indicators have been added (Channel Confinement, and Recruitment and Population Heterogeneity bull trout). All others are derived from NMFS[1] and USFWS[2]*

| Pathway | Indicators | Properly Functioning | At Risk | Not Properly Functioning |
|---|---|---|---|---|
| Habitat Elements *(continued from preceding page)* | Large Pools<br>*Bull trout*<br>(Adult holding, juvenile rearing and overwintering areas in streams >3m wide.) | Each reach has many large pools (>1m deep). | Reaches have few large pools (>1m deep) present. | Reaches have no deep pools (>1m deep). |
| | Off Channel Habitat | Numerous ponds, oxbows and backwater areas with cover and low energy off-channel areas (ponds, oxbows, etc.) | Some ponds, oxbows, and backwater areas with cover but side channels are high energy. | Few or no ponds, oxbows or backwaters, no off-channel ponds. |
| | Refugia | Habitat refugia exist and are buffered by intact riparian reserves. Existing refugia are sufficient in size, number and connectivity to maintain viable populations or sub-populations. | Habitat refugia exist but are not adequately buffered (by intact riparian reserves) existing refugia are insufficient in size, number and connectivity to maintain viable populations or sub-populations. | Adequate habitat refugia do not exist. |
| Channel Conditions and Dynamics | Width/Depth Ration<br>*Bull trout* | = 10 | 11-20 | >20 |
| | Width/Depth Ration<br>*Salmon* | <10 | 10-12 | >12 |
| | Streambank Condition | >90% stable (on average <10% of banks are eroding) or >80% of any stream reach has = 90% stability. | 50-80% of any stream reach has ≤ 90% stability | <50% of any stream reach<br>≤90% stability |
| | Channel Confinement | Reach is not channelized, directed or bounded by man-made structures. Natural stream channel meandering is not inhibited. | Reach is constrained or bounded at a single point by a man-made structure (i.e. a bridge or culvert). Come meandering of stream channel is possible above and below structure. | Reach is extensively channelized, directed or bounded by man made structures (i.e. straightening, diking, irrigation canals etc.) Natural stream channel meandering is impossible. |
| | Floodplain connectivity | Off-channel areas are frequently hydrologially linked to main channel, over bank flows occur and maintain wetland functions, riparian vegetation, and succession. | Reduced linkage of wetland, floodplains and riparian areas to main channel: overbank flows are reduced relative to historic frequency as evidenced by moderate degradation of wetland function, riparian vegetation and succession. | Sever reduction in hydrological connectivity between off-channel wetland, floodplains and riparian areas; wetland extent drastically reduced and riparian vegetation/succession altered significantly. |
| Flow/Hydrology | Change in Peak/Base Flows | Watershed hydrograph indicates peak flow, base flow and flow timing characteristics comparable to an undisturbed water shed of similar size, geology and geography. | Some evidence of altered peak flow, base flow and or flow timing relative to an undisturbed watershed of similar size, geology and geography. | Pronounced changes in peak flow, base flow and or flow timing relative to an undisturbed watershed of similar size geology and geography. |
| | Increase in Drainage Network | Zero or minimum increase in drainage network density due to roads or human caused disturbance. | Low to moderate increased in active channel length due to human caused disturbance. | Greater than moderate increase in active channel length correlated with human caused disturbance. (e.g. >20-25% increase). |
| Watershed Conditions | Road Density and Location | <2mi/mi_, no valley bottom roads | 2-3 mi/mi_, some valley bottom roads | >3mi/mi_, many valley bottom roads. |
| | Disturbance History | < 15% (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and /or riparian area and for NWFP area (except AMA), =15% retention of LSOG in watershed. | < 15% (entire watershed) but disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian area and for NWFP area (except AMA), =15% retention of LSOG in watershed. | >15% (entire watershed) and disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian area; does not meet NWFP standard for LSOG retention. |
| | Riparian Reserve | Riparian corridor provides adequate shade, large woody debris recruitment, habitat protection and connectivity in all sub-watersheds and buffers. Riparian corridor is at least 80% intact. Greater than 50% of riparian vegetation is composed of endemic spp. | Riparian corridor has a moderate loss of connectivity of function affecting shade, large woody debris recruitment, etc. (=70-80% intact). Between 25 and 50% of riparian vegetation is endemic. | Riparian corridor is narrow, fragmented, poorly connected or provides inadequate protection of habitat (<70% intact). Less than 25% of riparian vegetation is endemic. |
| Genetic Diversity | Recruitment, Population Structure, and Heterogeneity *(Bull trout)* | Action area has a healthy sub-population of bull trout (several thousand individuals)[3] or is directly linked to one. No barriers to migration between stocks (outside recruitment, recolonization, and straying are possible). All life history modes are possible (anadromous, fluvial or adfluvial and resident). Assumption: bull trout habitat exists (or did historically) in action area. | Action area has a small bull trout population with less than 500 but>50 adults_, but there are no barriers to any life history modes or interactions with outside subpopulations (recruitment, recolonization, and straying from outside sub-populations are possible). Assumption: bull trout habitat exists (or did historically) in action area. | Action area is terminal resident bull trout habitat with less than 50 adults_ in subpopulation. Recruitment, recolonization, and straying are not possible because of barriers present in the watershed. There is no potential for genetic introversion from outside stocks and no possibility of migratory life histories. Assumption: bull trout habitat exists (or did historically) in action area. |

[1]Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale NMFS, 1996.

[2]Framework to Assist in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Bull Trout Subpopulation Watershed Scale (Draft) USFWS, 1998.

[3] Rieman, B.E. and J.D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. USDA. Forest Service, Intermountain Research Station, Boise, ID.

## Table C-2: Common Task Description for Road Maintenance Activities

| Road Maintenance Activities | Description | Classification |
|---|---|---|
| **ACCESS ROAD MAINTENANCE:** | Surface grading, shaping, and rocking of the road surface. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **ASPHALT CONCRETE OVERLAY/PAVING:** | Paving of roads with asphalt concrete. The scope of work is limited to small paving projects, which are performed by Agency force. | Chemical and Paving/Concrete |
| **ASPHALT CONCRETE SURFACE PATCHING:** | Patching of deteriorated paved shoulders. The operation consists of the placement of hot asphaltic concrete over a tack-coated surface of concrete or other existing roadway surface. | Chemical and Paving/Concrete |
| **BACKFLOW VALVE/FLAPPER GATE:** | Install/Repair/Replace/Maintain the backflow valves/flapper gates associated with the municipal drainage system. | |
| **BARRICADING AND TRAFFIC CONTROL:** | This task is used to identify temporary barricades and warning signs set up by maintenance crews to identify hazardous areas (i.e., signs and barricades warning drivers of flooded roadways. ) | |
| **BRIDGE/BUILDING SANDBLASTING/PAINTING:** | Sandblasting bridge and building surfaces to remove scales, blisters, rust spots, etc., as well as subsequent bridge or building painting. | Structure Work and Chemical |
| **BRIDGE DEBRIS REMOVAL:** | Removal of debris and brush lodged in bridge underpinning and around piers, abutments, wingwalls, fenders, etc. | Structure Work and Chemical |
| **BRIDGE DECK CLEANING:** | Cleaning bridge decks by flushing using high pressure water from a water truck or by sweeping. | Structure Work and Chemical |
| **BRIDGE DECK REPLACEMENT:** | Replacement of damaged or deteriorated portions of bridge decks. Bridge decks may be made of corrugated steel plates or timber planks. | Structure Work and Chemical |
| **BRIDGE DECK RESURFACE:** | Resurfacing an existing pavement bridge with an asphalt concrete overlay. | Structure Work and Chemical |
| **BRIDGE DRAINS - CLEAN:** | Cleaning drains on bridge decks either by hand or by using high-pressure water from a water truck. | Structure Work and Chemical |
| **BRIDGE - EROSION CONTROL:** | Placement of rock walls, riprap, or broken concrete pieces to protect the slopes of bridge approaches and bridge structure. | Hydraulic Modification, Structure work and Chemical |
| **BRIDGE REPAIR - ELECTRICAL:** | Maintenance of electrical systems on movable bridge spans. | Structure Work and Chemical |
| **BRIDGE REPAIR - MECHANICAL:** | Mechanical maintenance performed on bridges. Activities include repair or replacement of equipment and machinery used to operate movable bridge spans. | Structure Work and Chemical |
| **BRIDGE REPAIR - RAIL:** | Repair or replacement of damaged bridge rails and/or wheel rails. | Structure Work and Chemical |
| **BRIDGE REPAIR - STRUCTURAL:** | Maintenance of bridge substructures. Activities include repair or replacement of pilings, abutments, piers, trusses, fenders, etc. | Structure Work and Chemical |
| **BRIDGE SURFACE CLEANING:** | Removal of dirt, debris, small rocks and loose oxidized expansion joint material. It also includes repair/replacement of expansion plates and angles. | Structure Work and Chemical |
| **BRUSH CUTTING:** | Cutting of encroaching brush and grass that occurs annually the full width of the ROWís. To control vegetation within the right of way to provide visual inspection of systems, to allow detection of leaks or damage and to control brush that grows on the ROWís that limits access, inspection or public safety. | Vegetation and Chemical |
| **BUILDING - ELECTRICAL REPAIR:** | Repair of electrical systems in Agency buildings and yards | Chemical |
| **BUILDING MACHINERY SERVICE:** | Periodic service maintenance of building machinery, i.e., changing filters, replacing fan belts, lubrication, etc. | Chemical |
| **BUILDING - PAINTING:** | Painting of Agency buildings, offices, etc. | Chemical |
| **BUILDING - PLUMBING:** | Plumbing repair services provided to Agency buildings. | Chemical |
| **BUILDING - STRUCTURAL:** | Major structural repair of Agency buildings damaged by vandalism, wind, flooding, etc. | Chemical |
| **CARPENTRY:** | Carpentry work performed on Agency buildings. | Chemical |
| **CATCH BASINS/MANHOLES CLEAN - VACTOR:** | Flushing and removing sediment and debris from catch basins and manholes using a vactor or vacall. | Earth/Surface or cleaning Work and Chemical |
| **CATCH BASINS/MANHOLES - TYPES I & II - REPAIR/REPLACE:** | Repair, Replacement or reconstruction of Type I & II ("manholes") catch basins within the existing Agency drainage system. | Earth/Surface or cleaning Work and Chemical |
| **CATCH BASIN/MANHOLE LIDS - TYPES I & II - REPLACE:** | Replacement of missing catch basin or manhole covers. Loss of lids is primarily caused by vandalism or theft. | Earth/Surface or cleaning Work and Chemical |
| **CONCRETE SIDEWALKS INSTALLATION:** | Installation of sections of cement sidewalks. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **CRACK POURING:** | Cleaning and filling of cracks and expansion joints in PCC and AC roads. | Chemical and Paving/Concrete |
| **CULVERT HEADER/TRASH RACKS - REPLACE/REPAIR:** | Replacement or repair of concrete support to the entrance and discharge ends of drainage systems. The purpose of such supports is to direct the drainage flow into or out of the pipe so as to prevent scouring or erosion around the pipe. This task also includes repair or replacement of trash racks. | Earth/Surface or cleaning Work, Vegetation, Hydraulic Modification and Chemical |

## Table C-2: Common Task Description for Road Maintenance Activities (Continued)

| Road Maintenance Activities | Description | Classification |
|---|---|---|
| **CURB & GUTTER REPLACE/REPAIR:** | All activities necessary to repair or replace sections of Portland Cement Concrete (PCC) curb and gutter. | Earth/Surface or cleaning Work, Paving/Concrete and Chemical |
| **CURB INSTALLATION (PCC):** | This task covers activities necessary for the installation of Portland Cement Concrete (PCC) curb and gutter or extruded curb. | Earth/Surface or cleaning Work, Paving/Concrete and Chemical |
| **DEBRIS REMOVAL:** | Transporting separated materials to approved vendors for disposal. | |
| **DEBRIS SORTING:** | Separating various forms of construction waste in preparation for disposal. | |
| **DECHLORINATION:** | Water is de-chlorinated to neutralize the free chlorine residual contained in the distribution system before it is discharged to surface drainage system. | Chemical |
| **DETENTION SYSTEM:** | Install/Repair/Replace/Maintain the appurtenances associated with the municipal drainage system to maintain or clean a detention system. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **DIKE MAINTENANCE:** | Install/Repair/Replace/Maintain associated parts of the dike structure to comply with dike inspection, maintenance standards and requirements. | Earth/Surface or cleaning Work, Vegetation, Hydraulic Modification and Chemical |
| **DITCH CLEANING - DITCHMASTER:** | All activities involved in the reshaping and cleaning of roadside ditches performed with Ditchmaster. | Earth/Surface or cleaning Work, Hydraulic Modification, Vegetation and Chemical |
| **DITCH EXCAVATION:** | Cutting new ditch lines to provide storm water drainage. | Earth/Surface or cleaning Work, Hydraulic Modification, Vegetation and Chemical |
| **DITCHING - BUCKET:** | Removing debris, vegetation and sedimentation from ditches and re-establishing the roadside flowline. This task may be accomplished with a front end loader, a drott, or a backhoe. | Earth/Surface or cleaning Work, Hydraulic Modification, Vegetation and Chemical |
| **DITCHING/SHOULDER PULLING - BLADE:** | This task involves the cleaning or reshaping of roadside ditches, and/or shoulders with a motor patrol grader to ensure proper drainage. | Earth/Surface or cleaning Work, Hydraulic Modification, Vegetation and Chemical |
| **DRAINAGE PIPE INSTALLATION:** | Installation of drainage pipe in Agency right-of-way. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **DRAINAGE PIPE REPLACE/REPAIR:** | This task covers activities necessary to replace or repair drainage pipe. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **DRAINAGE PREPARATION:** | Activities necessary for preparation of drainage projects, including utility location coordination with equipment vendors, and sawcutting. | Earth/Surface or cleaning Work and Chemical |
| **DRAINAGE SYSTEMS -HAND CLEANING:** | Hand cleaning of plugged openings to enclosed systems, driveway approaches, or frontage pipe when it is impractical to use machinery. | Earth/Surface or cleaning Work and Chemical |
| **DUST CONTROL:** | This task involves treating gravel roadways or shoulders for dust control using dust oil, lignum sulfate, or water. | Chemical |
| **ENCLOSED DRAINAGE SYSTEMS CLEANING - EQUIPMENT:** | This task involves cleaning culverts with either: 1) a water truck with a flusher hose or, 2) a vactor truck with a jet rodder attachment. Activities include cleaning of any culvert, such as driveway culverts, cross-tiles, or enclosed systems. | Earth/Surface or cleaning Work, Hydraulic Modification, Vegetation and Chemical |
| **EQUIPMENT CLEANUP:** | Activities covered under this task involve washing and cleaning interiors, exteriors, and components of equipment. | Chemical |
| **EQUIPMENT TRANSPORTING:** | Time spent transporting equipment to and from equipment maintenance shops, or from one headquarters to another. | Chemical |
| **FENCE INSTALLATION:** | Installation of new fencing (usually chain link) along Agency roadway or around Agency-owned facilities for security purposes. | Chemical |
| **FENCING - REPAIR:** | Maintenance and repair of Agency-owned fencing. | Chemical |
| **GABION RETAINING WALLS INSTALLATION:** | Preventing erosion on slopes by installation of gabion retaining walls. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **GABION RETAINING WALLS - REPAIR/REPLACE:** | Placement and repair of gabion retaining walls along slopes to prevent erosion. | Earth/Surface or cleaning Work and Chemical |
| **GRAFFITI REMOVAL:** | Removal of inscriptions or drawings scratched, painted or sprayed on walls, roads or facilities. | Chemical |
| **GRAVEL PATCHING:** | Refilling potholes and ruts in gravel roads and shoulders. | Earth/Surface or cleaning Work and Chemical |
| **GRAVEL SURFACE - NEW MATERIAL:** | Routine maintenance of gravel roads by the addition of new material. | Earth/Surface or cleaning Work and Chemical |
| **GUARDRAILS INSTALLATION:** | Installation of guardrails along shoulders, bridge approaches, dead ends, etc. | Earth/Surface or cleaning Work and Chemical |
| **GUARDRAIL - REPAIR:** | Removal/replacement of damaged guardrails. | Earth/Surface or cleaning Work and Chemical |

## Table C-2: Common Task Description for Road Maintenance Activities (Continued)

| Road Maintenance Activities | Description | Classification |
|---|---|---|
| **GUARDRAIL POSTS - REMOVAL:** | Removal of concrete guardrail posts after the rail has been removed. The removal of concrete posts is a program developed by an agency in response to the Standard Specifications of the State of Washington, which prohibits the continued use of concrete posts adjacent to the driving surface. | Earth/Surface or cleaning Work and Chemical |
| **GUIDEPOSTS - INSTALL/REPAIR:** | Removal and replacement or installation of guideposts at the edge of the driving surface in dangerous areas. | Earth/Surface or cleaning Work and Chemical |
| **HAND BRUSHING:** | Manual cutting of brush. Removal of fallen trees, which have been blown down during a storm, should also be reported under this task. | Vegetation and Chemical |
| **HAND DITCHING:** | Hand cleaning open ditch. Hand ditching is undertaken when it is impractical to use machinery. This activity may be necessitated by excess leaves, debris, or grass which restricts the flow of storm water. | Earth/Surface or cleaning Work, Hydraulic Modification, Vegetation and Chemical |
| **HAZARDOUS MATERIAL CLEANUP:** | Emergency cleanup of any hazardous materials, such as oil, glass, gravel, excess mud. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **HYDRANTS:** | Install/Repair/Replace/Maintain appurtenances including excavation work involving hydrants associated with a water system. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **LANDSCAPE MAINTENANCE:** | Maintenance of landscaped areas in the Agency right-of-way.l | Vegetation and Chemical |
| **LANDSCAPE RESTORATION:** | This task shall be used to report time spent restoring landscape on private Agency Property, which has been damaged in the course of Agency Road Maintenance activities or by failure of Agency road systems. Restoration activities could include fence repair, replacing trees and shrubs, etc. | Vegetation and Chemical |
| **LITTER CLEANUP:** | Cleanup activities to provide a litter-free roadway. Litter may be manually picked up and placed directly into a dump truck or pickup. It can also be placed in plastic litter bags to be hauled away at a later time. | Chemical |
| **MEDIAN BARRIER INSTALLATION:** | Placement of median barrier walls along slopes to provide traffic separation. | Chemical |
| **MEDIAN BARRIER WALLS INSTALLATION:** | Installation of median barrier walls to prevent sloughing or movement of soil into the ditchline and to protect the roadway from falling rock and dirt, provide traffic diversion, pedestrian safety, etc. | Chemical |
| **MOWING - HAND:** | Hand mowing of planted areas in the Agency right-of-way such as medians, roadside planter strips, etc. | Vegetation and Chemical |
| **MOWING - CONTRACT:** | Contracted hand mowing of planted strips in the agency right-of-way i.e., medians, roadside planter strips, etc., low level pruning of street trees, edging of sidewalks, meaning the build up of sand, etc. on street sides and meaning the vegetation that grows in the inside of walkways. | Vegetation and Chemical |
| **MOWING SLOPE/SHOULDER:** | Cutting of vegetation on the shoulder, ditchline, or back slope with a specially designed mower. | Vegetation and Chemical |
| **PCC PAVEMENT REMOVE/REPLACE:** | Removal and replacement of Portland Cement Concrete pavement, which shows signs of deterioration. | Chemical and Paving/Concrete |
| **PAVEMENT EDGE EXTENTION:** | Paving shoulders at intersections or along roadway edge to extend pavement surface to enhance traffic and pedestrian safety and/or improve surface water drainage. | Earth/Surface or cleaning Work, Paving/Concrete and Chemical |
| **PETROMAT PATCHING:** | Placement of fabric over distressed areas of pavement bonded by tack coat and overlayed with hot mix asphalt. | Chemical and Paving/Concrete |
| **PETROTAC PATCHING:** | Placement of rubberized asphalt mat over distressed asphalt where immediate overlay with hot mix asphalt is not required. | Chemical and Paving/Concrete |
| **PIPE MARKING:** | Marking of the roadway surface to indicate location and direction of the structure beneath. The main purpose of this activity is to provide ready identification of the structure for any crew, which may be called to work on it. | Chemical |
| **POTHOLE PATCHING:** | Patching holes, which have developed in asphaltic roadways. The activity consists of removing loose and broken pavement and filling the hole with an asphaltic material. | Chemical and Paving/Concrete |
| **PUMP STATION:** | May include repair, replace, maintain or install any or all pumps or appurtenances in or around the station. | |
| **RESERVOIRS:** | May include repair, replace, maintain or install any or all appurtenances in or around the reservoir system. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **RETAINING WALLS- INSTALLATION:** | Installation of retaining walls to prevent slope erosion along roadways. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **RETAINING WALLS - REPAIR:** | Repair miscellaneous retaining walls to ensure adequate erosion control. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **RETENTION SYSTEM:** | Install/Repair/Replace/Maintain the appurtenances associated with the municipal drainage system to maintain or clean a retention system. | |

## Table C-2: Common Task Description for Road Maintenance Activities (Continued)

| Road Maintenance Activities | Description | Classification |
|---|---|---|
| **RIP RAP INSTALLATION:** | Installation of a rip rap wall to prevent erosion along roadways. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **RIGHT OF WAY CLEAN UP:** | Removal of illegally dumped trash, rubbish and debris from ROWs or city property. | Chemical |
| **RIGHT OF WAY SURFACE MAINTENANCE:** | This is the filling of ruts or depressions from maintenance vehicles or vandalism from off road vehicles on right-of-way. Also includes maintenance of brush or trees, deadwood removal, blow downs, hazard trees or obstructions. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **RIP RAP - EROSION CONTROL:** | Use of riprap to form a wall, which stabilizes roadside slopes. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **ROADWAY GRADING:** | This task involves the grading of gravel roads. | Earth/Surface or cleaning Work and Chemical |
| **ROADWAY PRELEVEL:** | Placement of hot asphaltic concrete over a tack-coated surface of existing roadway to smooth out irregularities in the roadway elevation. | Chemical and Paving/Concrete |
| **ROADWAY/SHOULDER PREPARATION:** | All activities necessary to prepare road surfaces and shoulders for construction of roadway sections. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **ROCK RETAINING WALLS INSTALLATION:** | Installation of rock walls along slopes to protect the roadway from eroding or sliding material. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **ROCK RETAINING WALLS - REPAIR/REPLACE:** | Replacement of large rocks, which are part of a retaining wall. Activities may entail the building of an entire rock wall or a simple adjustment of existing or additional rocks as needed. | Earth/Surface or cleaning Work and Chemical |
| **SANDBAGGING:** | Placement of sandbags to hold back floodwaters, protect public and/or private property. | Chemical |
| **SEAL COAT:** | Applying crushed gravel over tack coat followed by immediate compaction to provide a new driving surface. | Chemical and Paving/Concrete |
| **SHOULDER GRADING:** | Grading and reshaping gravel shoulders as they become rutted and irregular. This task is performed with the use of a motor patrol grader. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **SHOULDER PAVING:** | Paving of roadway shoulders. | Chemical and Paving/Concrete |
| **SHOULDER RESTORATION CONSTRUCTION:** | Rebuilding roadway shoulders before overlay or shoulder paving -- includes blading, reshaping, adding and compacting new material. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **SHOULDER RESTORATION - NEW MATERIAL:** | Restoration of roadway shoulders which requires additional material to ensure proper grade. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **SIDEWALKS/WALKWAYS - REPAIR:** | This task involves removal and replacement of sections of sidewalks or walkways (concrete or asphalt.) | Chemical and Paving/Concrete/Concrete |
| **SILT REMOVAL:** | Removal of sediment with the use of a backhoe or dragline. | Hydraulic Modification and Chemical |
| **SLIDE REMOVAL:** | Removal of slide material caused by unstable soils, heavy rains, flooding, broken water mains, storm system failures, etc. | Earth/Surface or cleaning Work, Vegetation, Hydraulic Modification and Chemical |
| **SNOW AND ICE CONTROL - SAND AND SALT:** | Spreading sand on roads and salt on bridges to control snow and ice. Stock piling sand and salt is also under this task. | Earth/Surface or cleaning Work, Vegetation and Chemical |
| **SQUARE CUT PATCHING:** | This task involves the removal and replacement of a square cut sections of loose and broken roadway surface or necessitated by construction projects. This task involves removal and replacement of base material when necessary. Examples of such projects are cross tile installation, catch basin installation, base failure repair, etc. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **STREET FLUSHING:** | Flushing the roadway surface to remove dirt and small debris. This task is usually required because of dirt spilled or tracked onto the roadway by dump trucks during construction operations. | Earth/Surface or cleaning Work and Chemical |
| **STREET SWEEPING:** | Sweeping roadways to keep them free of dirt and debris, and to prevent sedimentation from entering adjacent enclosed drainage systems. | Earth/Surface or cleaning Work and Chemical |
| **TRASH RACK/HEADER INSTALLATION:** | Installation of supports to the entrance and discharge ends of drainage systems to prevent scouring and erosion around the pipe. Installation of debris barriers, such as trash racks and "bird cages." | Earth/Surface or cleaning Work, Vegetation, Hydraulic Modification and Chemical |
| **TREE MAINTENANCE - CONTRACT:** | Contract work involving a bucket truck, a chip truck and a chipper to daylight roadways that have become overgrown. Trimming of trees that have taken over the right-of-way i.e., vegetation causing sight problems or vegetation hitting traffic. | Vegetation and Chemical |
| **TREE MAINTENANCE - ORNAMENTAL:** | Maintenance of ornamental trees planted in the Agency right-of-way. Activities include pruning, irrigation, replacements, etc. | Vegetation and Chemical |
| **TREE REMOVAL - DANGER:** | Contracted removal of trees on the Agency right-of-way, which could, during adverse weather conditions, fall upon private property, power lines, or roadways. | Vegetation and Chemical |
| **TREE TRIMMING:** | The removal of limbs and foliage from trees growing in the Agency right- of-way, which obstruct sight distance. | Vegetation and Chemical |

## Table C-2: Common Task Description for Road Maintenance Activities (Continued)

| Road Maintenance Activities | Description | Classification |
|---|---|---|
| **WASHOUT REPAIR:** | Replacement of material when major floods has damaged shoulder or roads. | Earth/Surface or cleaning Work, Vegetation, Hydraulic Modification and Chemical |
| **WASTEWATER POLLUTION CONTROL FACILITY:** | May include repair, replace, maintain or install any or all appurtenances in or around the control facility system. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **WATER FILTRATION FACILITY:** | All work necessary to repair, replace, install or maintain water pipes, mains, and systems at or near the Water Filtration Facility. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **WATER MAINS:** | Installation, repair, replacement, maintenance of the transmission lines, water mains and distribution lines associated with the delivery of water in a municipal water system. | Earth/Surface or cleaning Work, Paving/Concrete, Vegetation and Chemical |
| **YARDS, STOCKPILES, BORROW SITES - MAINTENANCE:** | Activities necessary to keep Agency yards, stockpiles and borrow sites in orderly condition. | Chemical |